



# EN

## EUROPEAN QUALIFYING EXAMINATION 2026

# PAPER A

This paper comprises:

- |                     |                 |
|---------------------|-----------------|
| * Client's letter   | 2026/A/EN/1-6   |
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| * Document D1       | 2026/A/EN/9     |
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Inhalt (6 Seiten „Schreiben des Mandanten“) nur auf dem  
Bildschirm während der Prüfung verfügbar

Content (6 pages „Client's letter“) only available on screen during  
the examination

Contenu (6 pages „Lettre du client“) uniquement visible sur l'écran  
pendant l'examen

Drawings

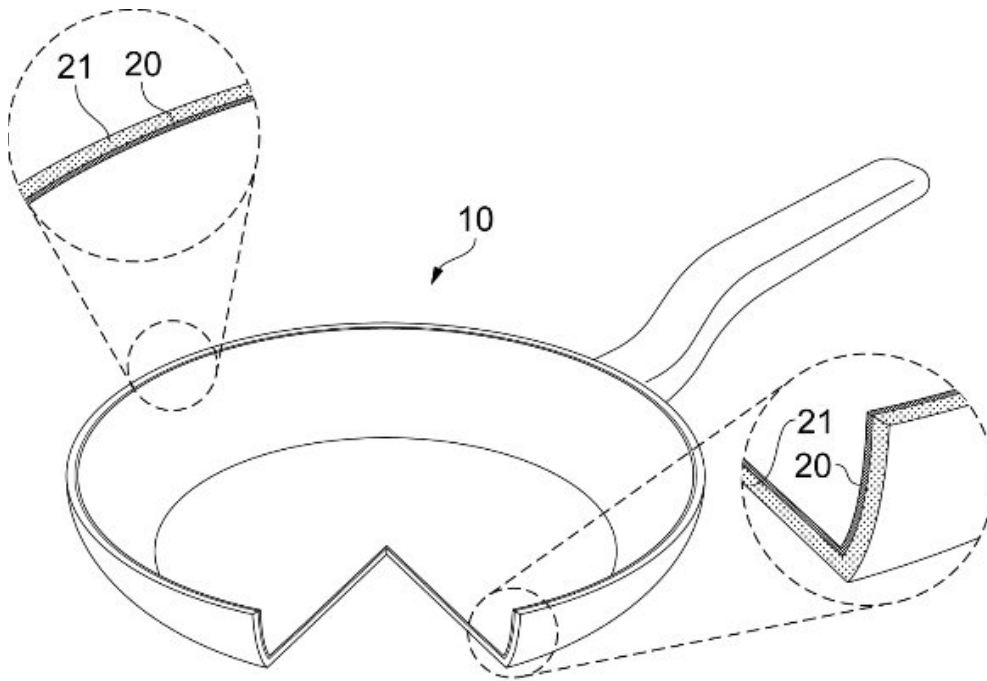


FIG. 1a

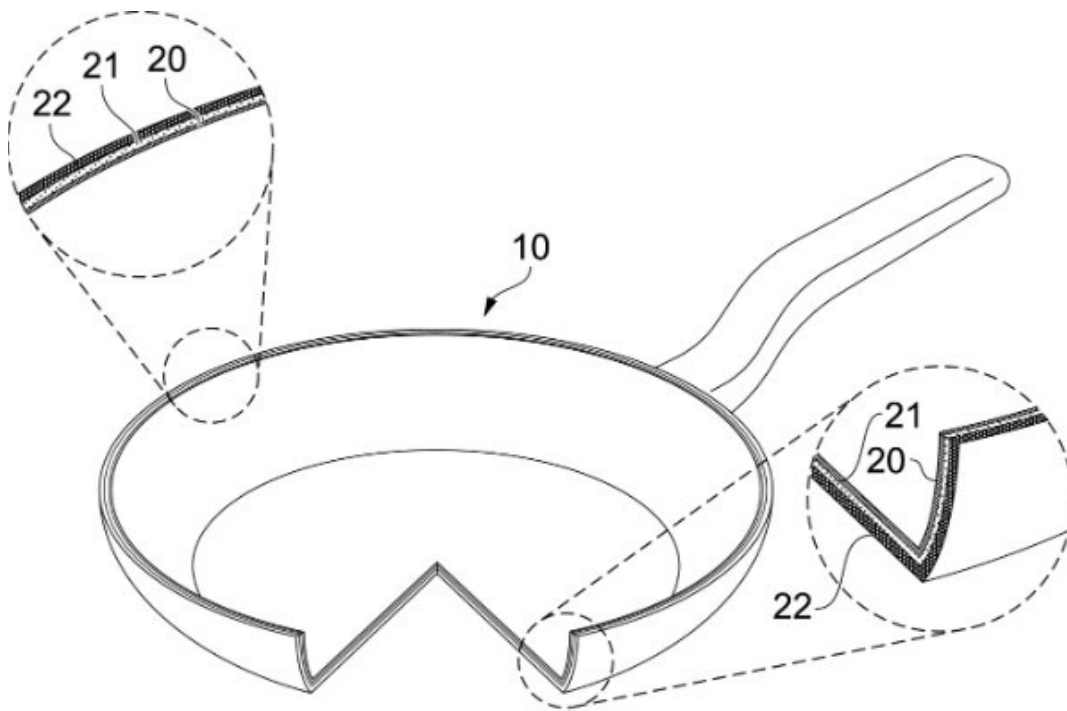


FIG. 1b

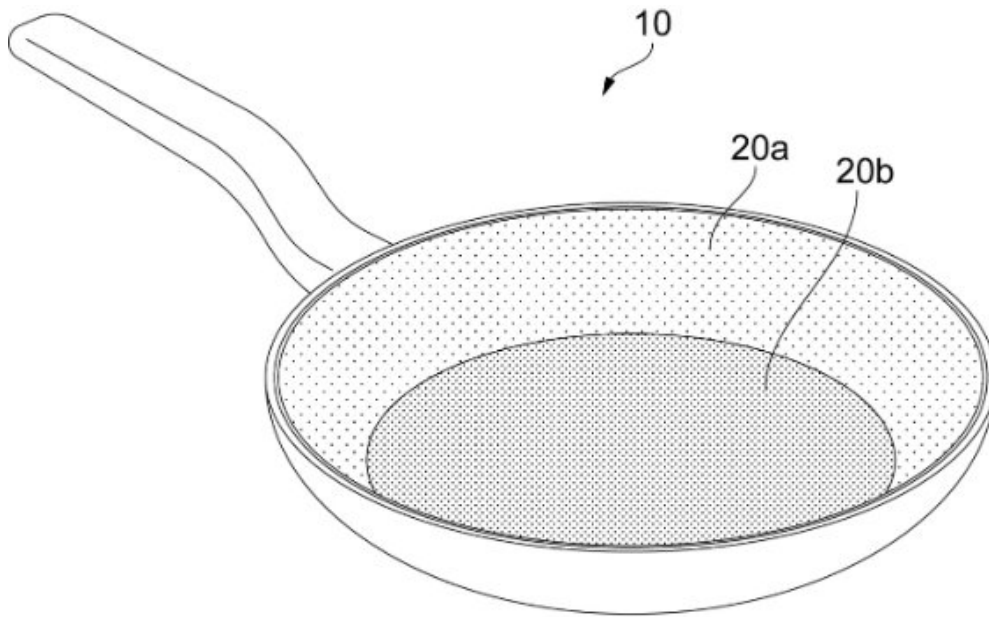


FIG. 1c

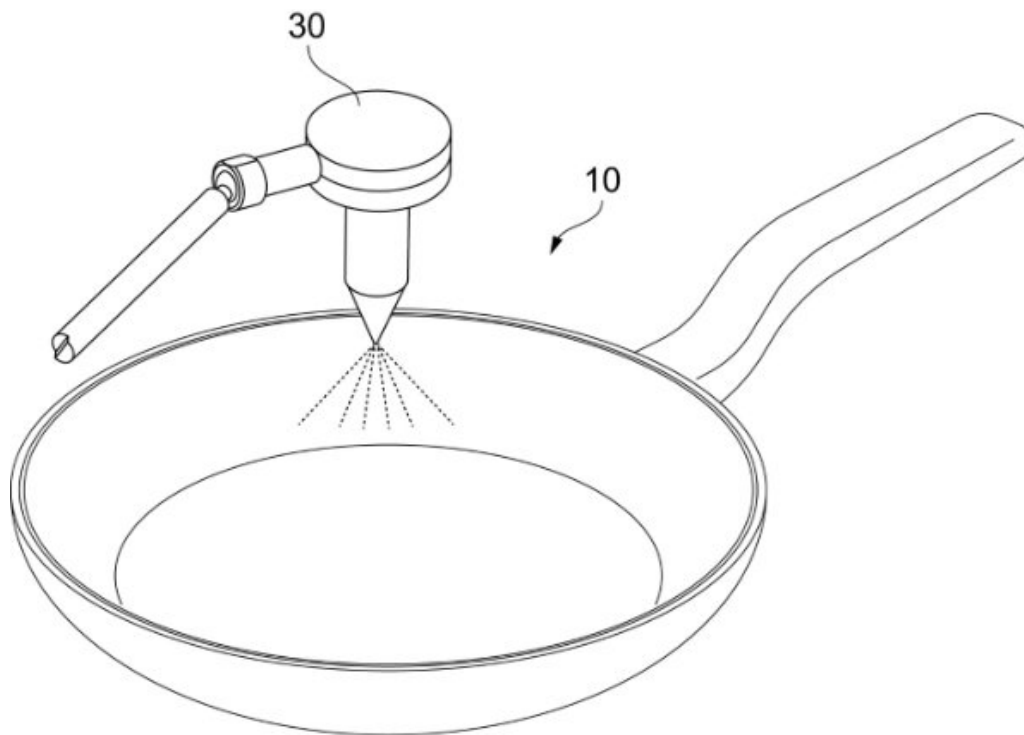


FIG. 2

**D1: EP06180111**

Applicant: Tefte-Loan GmbH

Filed 19.03.2006

Published 2007

5 Title: Cooking surface with improved non-stick coating

[001] Frying and baking has traditionally been practised in pans made of metal such as cast-iron or stainless steel. Although cast-iron pans are non-stick to some degree, they are extremely difficult and time-consuming to produce and maintain. As for stainless steel  
10 pans, the use of grease to prevent food from sticking to the pan is indispensable and exposes users to health risks associated with increased blood cholesterol.

[002] There is a tradition in certain cultures of making ceramic pots and pans by hand. For such cookware, a protective coating of a known sol-gel is usually applied. Although this  
15 ceramic-coated cookware has non-stick properties and is scratch-resistant, it is expensive and time-consuming to produce.

[003] We have developed Teflon™-coated metal cookware, which we have found to have better scratch resistance. They are easy and cheap to manufacture and have relatively low  
20 toxicity.

[004] We have also discovered that it is possible to make our newly developed coated cookware using two metal layers, with aluminium above for better adherence of the non-stick coating and stainless steel or iron beneath for better heat conductivity.

**D2: International Journal of Material Science, No. 1903, July-September 2021**

**Sol-gel compositions for metal treatment**

[001] Sol-gel coatings of metal surfaces have been successfully used in recent years in aeronautics and aerospace. Their anti-corrosion and liquid repellent properties together with their excellent hardness and scratch resistance in extreme weather conditions make them the ideal protective layer for the great diversity of metal surfaces used in such industries.

[002] The sol-gel coatings that have been studied here start with a sol precursor – such as TEOS (tetraethylorthosilicate), MTES (methyltriethoxysilane), GPTMS (3-glycidyoxypropyltrimethoxysilane) or MPTMS (3-mercaptopropyltrimethoxysilane) – to which a gel starter, which can be citric acid, ethanol, lactic acid or oxalic acid, is added to launch the gelation process. We usually use a ratio by weight of 1:1-6:1 sol precursor to gel starter, as we noticed that the sol-gel coatings do not form well outside this range.

Firstly, the sol precursor is added during a hydrolysis step. Then comes the gelation with the help of the gel starter, and subsequently a drying-densification takes place in ovens at high temperatures, preferably above 250°C.

[003] Right after the gelation and before the drying, the sol-gel composition is applied to the metal substrate using a special automatic spraying device that can move at speeds of up to 1.9 m/s. The spraying device is controlled by a control system to achieve an efficient application of the sol-gel composition. Its speed may be lowered to about 1.5 m/s to cover more complex surface areas. Its angle of application may be changed by the control system upon detection by an optical sensor of a change in inclination of the surface to efficiently cover areas that are inclined or more difficult to access. Geometrical spraying patterns corresponding to the boundaries of the surface to be coated can be stored in a memory, which the electronic controller of the control system can access to retrieve the appropriate pattern for the surface that will be treated. In this way, the unintended application of sol-gel composition beyond the surface to be treated is kept to a minimum.

[004] Adherence is best when the sol-gel coating is directly applied on the preferred substrate, which is made exclusively of aluminium.

[005] Such coated metal surfaces have proven to be an excellent alternative to Teflon™, fulfilling the high quality standards that the aeronautics and aerospace industries require. Teflon™ is still widely used in these industries but is toxic for the environment.

[006] The sol-gel coatings also have food contact standard, so they can also be used for cookware such as pans, pots or any other food container. The liquid repellent properties of the sol-gel coatings described above have been found to translate into non-stick properties when in contact with food items at the usual cooking temperatures.

[007] We are confident that such sol-gel coatings will find broader uses outside the aeronautics and aerospace industries in the coming years, as they have excellent anti-scratch and repellent properties while being non-toxic and environmentally friendly.

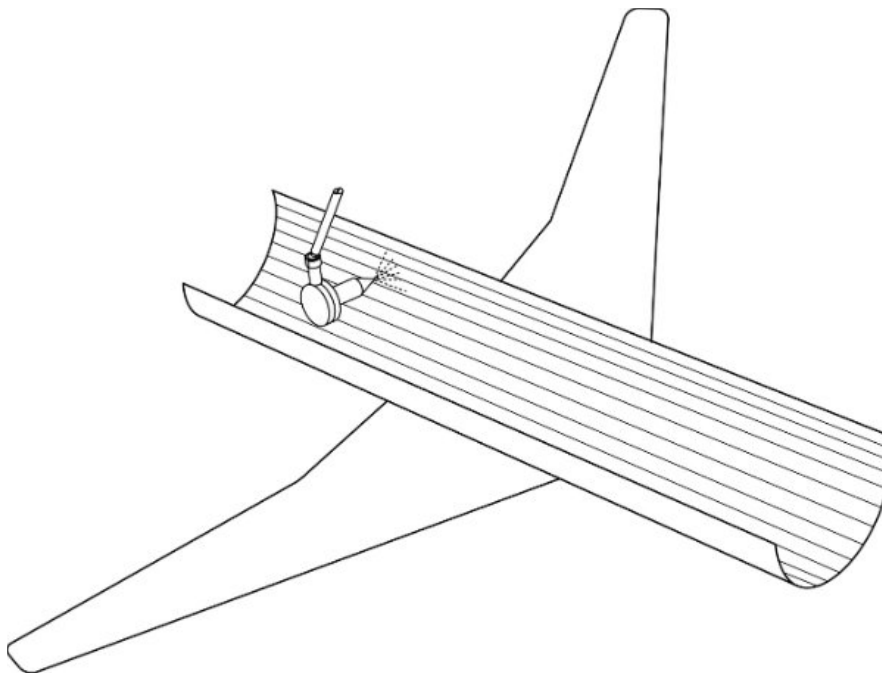


FIG. D2